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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,618	07/26/2001	Yoshikazu Nakayama	57A 3127	6828

7590 09/16/2003

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EXAMINER

DUDDING, ALFRED E

ART UNIT PAPER NUMBER

2853

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/915,618

Applicant(s)

NAKAYAMA ET AL.

Examiner

Alfred E. Dudding

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2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4 and 6-8 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Allowable Subject Matter*

1. The indicated allowability of claims 2 - 4 is withdrawn in view of the newly discovered reference(s) to Mancevski. Rejections based on the newly cited reference(s) follow.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 3/(2, 8), 4/(2, 8), 6/(2, 8), 7/(2, 8), and 8 are rejected under 35 U.S.C. 102(a) as being unpatentable over Yano et al. (U.S. 6,166,386 A) in view of Mancevski (U.S. 6,146,227 A)

Yano et al. discloses a lithographic method to form groove-form patterns on a sample surface comprising the steps of causing a tip end of a probe needle to contact a surface of a sample either continuously or intermittently, Figure 8, element 2401 (probe), Column 2, lines 24 25, said probe needle being an ultra-fine probe needle with a nano-size tip end diameter, applying a voltage across said probe needle and sample, and causing said probe needle to move while removing a substance that makes said sample at a probe needle contact area by an application of said voltage, Column 17, lines 249 – 53. Yano et al. discloses that the probe holder is a cantilever for an AFM (atomic force microscope), Figure 9, element 2402 (cantilever), and Column 1, lines 28 – 31. Yano et al. discloses a lithographic method wherein said sample is a

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lithographable matter including an organic film, other organic matter and an inorganic matter, and a voltage is applied across said probe needle and said organic film so that said probe needle is used as a cathode., Column 4, lines 37 – 40, Column 16, lines 28 – 30, and Figure 9, elements 24-5 (polyimide film), element 2406 (gold film).

Yano et al. teach all of the limitations of the claimed invention except for an ultra-fine probe needle is a nanotube probe that is formed by fastening a base end portion of a nanotube to a holder with a tip end portion of said nanotube being caused to protrude from said holder.

Mancevski discloses a nanotube probe that is formed by fastening a base end (pyramid) portion of a nanotube to a holder with a tip end portion of said nanotube being caused to protrude from said holder, Figure 3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the nanotube probe of Mancevski in the lithographic method of Yano et al. in order to obtain precise etching widths with a nanotube having controlled wall diameters and length.

4. Claim 7/(2, 8) is rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. in view of Hiraoka et al. (U.S. 4,464,460 A).

Yano et al. fail to teach the claimed invention of a lithographic method wherein said organic film is a polysilane film.

Hiraoka et al. discloses the use of a polysilane film on a substrate, Column 4, lines 6 – 14.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polysilane film on a substrate in order to etch said film without the use of a

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vacuum. The suggestion/motivation is given by the '460 patent Column 1, lines 46 – 47, a process for making an imaged oxygen-reactive ion etch barrier.

***Allowable Subject Matter***

5. Claim 5/(2, 8) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

a. A search of prior art did not cite a lithographic method wherein a groove width of and a groove depth of said groove of said groove-form pattern are controlled by adjusting a scanning speed of said probe needle and an applied voltage, as claimed in the limitations of claim 5/(1, 2).

***Response to Arguments***

6. Applicant's argument that the claims as presented are now allowable is moot in view of new art. Mancevski cites an atomic force cantilever with nanotube probe.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Muehl et al. (U.S. 6,306,779 B1) discloses removing inorganic material using a lithographic method employing a nanotube, Column 2, lines 11 – 21, and Figure 1, clearly seen.

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8. A corrected copy of the Notice of References, paper No. 2, submitted with the previous office action is enclosed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alfred Dudding whose telephone number is (703) 308-6082. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier, AU 2853, can be reached at (703) 308-4896. The fax phone numbers for this Group are (703) 305-3432, (703) 305-3431, (703) 308-7382, (703) 308-7724, and (703) 308-7722. The examiner's fax phone number is (703) 746-4390.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308-0956.

Alfred Dudding

ad

9-5-03



Stephen D. Meier  
Primary Examiner